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Energy Research

Incorporating Pollution Prevention Into the National Environmental Policy Act (NEPA) Process

Energy Research NEPA Distribution
Energy Research Pollution Prevention Work Group

The Office of Energy Research has prepared the attached NEPA Compliance Officer Communication concerning Incorporating Pollution Prevention Into the NEPA Process. This Communication is being issued as a follow-up to the February 12, 1993, Office of Environment, Safety and Health (EH-1) memorandum concerning incorporation of pollution prevention into NEPA analyses and encouraging that pollution prevention be considered during the NEPA process.

The Communication presents a variety of approaches that can be used to incorporate pollution prevention concepts into the conduct of the NEPA process. We have developed an example checklist which includes basic questions that can be asked during the early design phase of the project or activity. We also have available, on request, more detailed questions that might be incorporated into the checklist. These questions have been developed by other DOE sites for evaluation of pollution prevention alternatives. We recognize that resource availability and organizational structure of your facility will impact the process you select to incorporate pollution prevention into the NEPA process.

This Communication was developed in a Total Quality Management mode and resulted from initial work done by Susan Michaud of Oak Ridge National Laboratory and Sheryl Buck of Sandia National Laboratory. It was completed by a work group of ER/HQ, Operations Office, and research laboratory personnel. This effort is part of ER's efforts for continuous improvement in pollution prevention and NEPA products and services.

Incorporating pollution prevention into the NEPA review will help to provide early identification of pollution prevention opportunities which will result in reduced waste generation, toxic emissions, worker exposure, and worker and public risk to toxic and hazardous materials.

If there are questions on this Communication, please call Arnie Edelman on (301) 903-5145 or Clarence Hickey on (301) 903-4930.

/signed/

James K. Farley
NEPA Compliance Officer
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Attachment

ER NCO Communication 94-05

Office of Energy Research

Incorporating Pollution Prevention

into the
NEPA Process

1. INTRODUCTION

The goals of the National Environmental Policy Act (NEPA) and the thrust for their implementation are to avoid, lessen, or mitigate adverse environmental impacts and/or reduce risk before an action is taken. Similarly, the goals of pollution prevention are to lessen environmental impacts by promoting the reduction of waste generation, the use of energy efficient alternatives and the wise use of resources. The concepts of pollution prevention are logically suited for incorporation into the NEPA program.

The underlying tenets of pollution prevention completely support the overall goal of NEPA - to lessen the adverse impact of our activities on our environment and to consider environmental consequences in project decision-making. The NEPA review process should begin early in the planning stages of a project and will be documented through DOE approval of formal NEPA documentation received prior to the initiation of a project. The early planning phase is also the appropriate time to consider pollution prevention options.

In addition to the programs' compatibility, another benefit to including pollution prevention as part of the NEPA process is that the organizational and procedural infrastructure for NEPA already exists. Therefore, the NEPA process is a logical place to evaluate pollution prevention alternatives and take credit for their lessening of consequences. Through adoption of pollution prevention analyses under NEPA, crosscutting issues related to environment, safety and health can be addressed and limited resources can be more effectively utilized. Incorporating pollution prevention into the NEPA review will also help to provide early identification of pollution prevention opportunities to the project design team. Consideration should be made in the design of the activity for cost-effective pollution prevention techniques such as use of alternate chemicals, purchase of smaller quantities, design modifications, procedural changes, recycling solutions, etc.. These should result in less waste generation, toxic emissions, worker exposure, and worker and public risk to toxic and hazardous materials.

This document presents guidance for incorporating pollution prevention into the NEPA process. The options presented represent suggested approaches to implementing this concept and should not be viewed as requirements.

II. BACKGROUND

CEQ Guidance

On January 14, 1993, the Council on Environmental Quality (CEQ) issued a memorandum (published in the Federal Register on January 29, 1993) to Heads of Federal Agencies which encourages all federal agencies to incorporate pollution prevention principles, techniques, and mechanisms into their planning and decision-making processes, and to report such planning in documents pursuant to the National Environmental Policy Act (NEPA). CEQ's regulations for implementing the procedural provisions of NEPA direct all agencies to identify and assess reasonable alternatives to proposed actions that will avoid or lessen adverse effects of these actions upon the quality of the human environment [40 CFR 1500.2(e)].

DOE Guidance

On February 12, 1993, the U.S. Department of Energy's (DOE's) Office of Environment, Safety and Health (EH-1) issued a memorandum providing information on incorporating pollution prevention into NEPA analyses and encouraging that pollution prevention be considered during the NEPA process. The memorandum included as an attachment the CEQ memorandum issued on January 14, 1993.

The guidance document *Recommendations for the Preparation of Environmental Assessment and Environmental Impact Statements*, prepared by the Office of NEPA Oversight, U.S. Department of Energy, May 1993 states (page 6, item 4 Description of Alternatives, Including Proposed Action):

"In formulating (and analyzing the impacts of) the proposed action and alternatives, also comply with DOE's Policy on Waste Minimization and Pollution Prevention (August 20, 1992) which expresses a DOE commitment to 'inclusion of cost-effective consideration of these concepts and approaches in DOE's program planning and major assessment processes, where appropriate, such as NEPA'..."

While this guidance focuses on Environmental Assessments and Environmental Impact Statements, pollution prevention opportunities are optimally addressed during the initial project review stage.

III. SUGGESTED APPROACH

The proposed approach consists of developing standard information by project personnel early in the design phase for use during the internal scoping process and in the NEPA review. A checklist/form, designed by the site's line program staff or the site's waste minimization/pollution prevention coordinator, should be developed and provided to the project leaders and project engineers/designers ahead of the NEPA review and implemented as part of the formal NEPA documentation process. The checklist/form should be used as part of the NEPA review process to identify pollution prevention opportunities during the early planning stages of the project and to document results. Use of a checklist/form will help to provide consistency among reviewers and across projects.

A sample checklist is provided (Attachment 1). The checklist/form can be developed as a stand-alone document or incorporated into existing review documentation for new projects. Questions can be added or subtracted as appropriate to meet the needs of each facility and a list of chemicals such as those in the EPA's 33/50 program (toxic emission reduction on 17 chemicals-see Appendix A) can be attached. The checklist/form may vary based on the selected approach for implementation as discussed below. The results or answers to the questions then should be provided to the NEPA document preparers for incorporation into the appropriate NEPA document.

IV. IMPLEMENTATION OPTIONS

Three options are presented for incorporating the pollution prevention checklist/form as part of the NEPA process. Each of the implementing options include an assessment of pollution prevention considerations via a checklist/form to document that pollution prevention was considered during the NEPA process. In all three cases, the checklist results would be provided to the NEPA document preparers. The implementing options include assessment and documentation by the:

- A. Principal Investigator or Responsible Project Manager;
- B. Multi-disciplinary Review Team; and/or
- C. Dedicated Waste Minimization/Pollution Prevention Staff

Each of the proposed approaches requires different resources for implementation; therefore, the available resources and level of expertise at each site, as well as the size of the project being evaluated, will influence the approach that can be adopted. The options presented are not mutually exclusive and may be used in combination, even within a given project.

What ever approach is selected for a given project at a site, the NEPA documentation (CX, EA, etc.) should include a discussion of the proposed pollution prevention actions as part of the Project Description and an assessment of the impact of using pollution prevention concepts on the overall project. Where alternative pollution prevention activities are available, these options should be presented in the Alternatives Section and assessed in the Environmental Impact section of the EA or EIS.

A. Option 1: Assessment/Documentation by Principal Investigator or Responsible Project Manager

For this option, the pollution prevention checklist/form is completed by the principle investigator or responsible project manager. The checklist/form would be provided by the program or NEPA program manager to the principal investigator or project manager as part of the early project design analysis and for the NEPA documentation package.

Advantage(s):

- Requires the least amount of staff resources,
- Places the responsibility for considering pollution prevention opportunities on the project manager/ principal investigator.
- Most useful for smaller projects (i.e., non-MP/MSA).

Limitation(s):

- Willingness of principal investigator to complete the checklist/form,
- Varying levels of interest or pollution prevention expertise of the project manager/principal investigator,
- Inexperience of the principal investigator or project manager in completing the checklist/form,
- Some baseline training or brief guidance document including specific pollution prevention examples may need to be developed.

B. Option 2: Assessment/Documentation by Multi-disciplinary Review Team

The second approach is to assemble a team of technical experts, including project engineers, purchasing representatives, compliance specialists, waste managers, program representatives, and other appropriate participants. The team could either be established to review all projects or separate teams created to review individual projects. In addition, the team could be utilized to provide technical pollution prevention expertise to the principal investigator/project manager and help in the design of the project.

An example of the team approach is that taken at Sandia National Laboratories in Livermore, California. Project descriptions are routed to a standard distribution that makes up an Interdisciplinary Team (IDT) of environment, safety, and health programs, and staff from facility engineering and security departments. Representatives of these programs review and comment, submitting their input to the NEPA staff. The IDT may meet as a group with the project team for more detailed discussion, clarification, questions and answers.

Advantage(s):

- Team review provides more depth and multiple expertise to identify pollution prevention opportunities.
- Useful for large projects (i.e., MP/MSA)

Limitation(s):

- Resource intensive.

Although this approach is labor intensive, Sandia has found that this approach expedites project initiation, can provide design guidance early on in project planning (for significant cost savings) and facilitates compliance with regulatory guidance.

C. Option 3: Assessment/Documentation by Dedicated Waste Minimization/Pollution Prevention Staff

The third option is to utilize a technical expert(s) dedicated to the review of all projects for pollution prevention opportunities, where such expertise is functionally available.

The Oak Ridge National Laboratory (ORNL) has incorporated their Waste Minimization/Pollution Prevention Coordinator into the review/approval process for NEPA documents. For each project, a "Project Review Checklist" must be prepared by the project manager. The checklist includes questions relating to pollution prevention on source reduction, product substitution, recycling/reclamation, and waste segregation. The Environmental Review and Documentation Section of ORNL reviews the completed checklist and based on the information prepares a "Pollution Prevention Determination Form" to document if any special pollution prevention activities are required. This form is prepared for all projects and is forwarded to the site's Waste Minimization/Pollution Prevention Coordinator for review and or approval. The document is also provided to the NEPA program for use in preparing the NEPA documentation. Copies are available upon request from the Office of Environment, Safety and Health Technical Support at (301) 903-5145.

Advantage(s):

- Consistency among project reviews,
- Availability of technical expertise in pollution prevention.
- Pollution Prevention is not overlooked and gets priority attention on each project.

Limitation(s):

- Because the waste generator does not participate in the review the waste generator perspective (the individual who knows the most about how much and why waste is generated) is lost or incomplete. This can be overcome if the Waste Minimization/ Pollution Prevention Coordinator works closely with the project manager.
- Good communications are necessary from the Pollution Prevention Staff to others.

V. CONCLUSION

The inclusion of pollution prevention considerations in project design and project checklists encourages staff to consider pollution prevention options prior to beginning projects and in the NEPA analysis. Use of a pollution prevention checklist/form during the NEPA process to identify pollution prevention opportunities early in the planning stages of a project can result in economic and environmental benefits due to reduced disposal costs and risks; helps in the evaluation of options and alternatives, and discloses all of these to the public. In addition, it will provide more complete information to the DOE decision makers for use in making informed quality decisions.

Implementation of this approach may vary based on staffing considerations; however, the result remains a documented approach to evaluating pollution prevention opportunities during project planning activities to lessen environmental impacts through reduction of waste generation, efficiency in the use of raw materials and energy, and conservation of natural resources. The information documented during this process can be shared with other facilities and can serve as a valuable information resource which documents our pollution prevention activities.

Attachment 1

**Sample Checklist for Evaluating Pollution Prevention
and Incorporating It Into the NEPA Project Evaluation Process**

For your specific project/activity

1. Will the project/activity generate waste or environmental emissions?
Yes____No____

If yes:
 - a) Estimate quantities and types.
 - b) Estimate environmental releases.
2. If chemicals are to be used:
 - a) Evaluate the use of less toxic materials or minimizing use (i.e., micro-scale experiments vs. full scale)
 - b) Check existing chemical inventories. Can chemicals already purchased be used? Check "Swap Shop" or exchange programs. Share with a co-worker.
 - c) Will this project or activity use hazardous chemicals in a quantity in excess of 10,000 pounds annually? Yes____No____

If yes, list the chemical(s). Is the chemical a "Toxic Release Inventory Chemical" subject to Toxic Release Inventory Reporting (40 CFR Part 317)
 - d) Are any of the chemicals proposed for this project subject to any other program at your site (Appendix A). Provide a list of these chemicals.
3. Has a cost/benefit analysis been done, to get a rough estimate of potential savings in disposal dollars, energy savings, operations savings, etc. from pollution prevention?
Yes____No____
4. Can waste generation or environmental emissions be reduced and quantified? Yes____No____
5. If the project involves the purchase of equipment, give preference to energy-efficient, oil-less or recirculating-fluid equipment.
6. Is the principal function or some aspect of the project focused on waste reduction, recycling/reuse, or treatment of waste? Yes____No____
7. Consider new material acquisitions with recycled content.
8. Is this a new waste minimization or treatment technology? Can the results be applied at other DOE facilities, within DOD or industry?
Yes____No____
9. Has pollution prevention been incorporated into the project/facility design plans? Yes____No____ If yes, describe.

10. Have materials been considered in the project design that would reduce Decommissioning and Decontamination waste? Yes____No____
11. Pollution Prevention: Consider the following pollution prevention methods and their applicability to the proposed or ongoing project. (If planned for a proposed project or currently practiced for an ongoing project, please indicate by providing a brief statement.)
- a) Pollution Prevention Practices (Source reduction, equipment, process, or procedure modification, improved housekeeping and/or maintenance to reduce generation and release of pollutants)
 - b) Waste Volume Reduction (Elimination or minimization of volume of waste generated)
 - c) Waste Toxicity Reduction (Elimination or minimization of toxicity of waste generated)
 - d) Waste Segregation (Radioactive from hazardous and/or sanitary)
 - e) Materials Recycling (Filtering, distilling, reuse on same project, reuse on other project)
 - f) Product/Materials Substitution (Substituting environmentally acceptable materials for hazardous/toxic substances)
 - g) Inventory Control (Selecting types and quantity of materials that would result in reduced waste volume and/or toxicity)
 - h) Energy Conservation (Techniques/practices for reducing energy use)

Note: Detailed checklists and additional questions that can be used to address pollution prevention as part of the NEPA process have been developed by ORNL, Westinghouse, and others. Copies of these documents are available upon request from the Office of Environment, Safety and Health Technical Support at (301) 903-5145.

Appendix A
Target Chemicals

EPA's 33/50 Program Chemicals

The US-EPA has targeted 17 chemicals for waste reduction.

1. Benzene
2. Cadmium & Cadmium Compounds
3. Carbon Tetrachloride
4. Chloroform (Trichloromethane)
5. Chromium & Chromium Compounds
6. Hydrogen Cyanide & Cyanide Compounds
7. Lead & Lead Compounds
8. Mercury & Mercury Compounds
9. Methylene Chloride (Dichloromethane)
10. Methyl Ethyl Ketone
11. Methyl Isobutyl Ketone
12. Nickel & Nickel Compounds
13. Tetrachloroethylene (Perchloroethylene)
14. Toluene
15. Trichloroethane (Methyl Chloroform)
16. Trichloroethylene
17. Xylenes (m,p,o and mixed isomers)

Class I Ozone Depleting Chemicals

(partial list)

- Dichlorodifluoromethane (CFC-12)
- Trichlorotrifluoroethane (CFC-113)
- Carbon Tetrachloride (tetrachloromethane)
- Methyl Chloroform (1,1,1-trichloroethane)

Extremely Hazardous Substances

(partial list)

- ACRYLAMIDE
- BORON TRIFLUORIDE
- BROMINE
- CARBON DISULFIDE
- CHLORINE GAS
- CHLOROFORM*
- DIGLYCIDL ETHER SOLUTION
- DIMETHYL SULFATE
- FORMALDEHYDE
- HEXACHLOROCYCLOPENTADIENE
- HYDRAZINE
- HYDROGEN FLUORIDE SOLUTION
- HYDROGEN PEROXIDE
- HYDROQUINONE
- LITHIUM HYDRIDE
- LITHIUM HYDRIDE MIXTURE
- MERCURIC ACETATE*
- MERCURIC CHLORIDE*
- MERCURIC OXIDE SOLUTION*
- NITRIC ACID**
- NITRIC OXIDE CYLINDER
- NITROGEN DIOXIDE
- PHENOL
- PHOSPHOROUS SOLUTION
- PHOSPHORUS PENTOXIDE MIXTURE
- POTASSIUM CYANIDE
- PYRENE
- SELENIOUS ACID
- SODIUM ARSENATE
- SODIUM CYANIDE
- SULFURIC ACID**
- TELLURIUM
- VANADIUM PENTOXIDE

* Also a 33/50 chemical